Concept of Naval Force Health Protection for the 21st Century

Preface

As Navy and Marine Corps warfighters develop new concepts and strategies to adapt to global changes and to fiscal and political realities, the medical force supporting them must adapt also to remain relevant to the full spectrum of missions in the 21st Century. These missions likely will vary significantly in type, scope, and scheme of maneuver. There may be a major theater war (MTW) or even two simultaneous major theater wars or there may be smaller scale contingencies, operations other than war or Other Expeditionary Operations as defined by the current family of Marine Corps Concepts in the 21st Century. The most challenging scenario will be the MTW involving ground combat operations and significant numbers of Naval personnel afloat and ashore. Smaller scale contingencies may require less traditional health service support (HSS) assets (i.e. not the same size HSS units as with the larger forces), but may have significantly more complex non-traditional operational issues to address such as lack of infrastructure or established Lines of Communications or LOCs.

For the Navy and the Marine Corps of the 21st Century combat operations may no longer rely on massive force-on-force attrition strategies with large shore-based logistics infrastructures. They instead will rely on technological and information supremacy; smaller, more agile forces; focused logistics; and innovative schemes of maneuver. As part of the Seabased logistics infrastructure, health support forces will have to be smaller, more agile, technologically advanced, and much more adaptive.

Naval Force Health Protection for the 21st Century (NFHP-21) is the Navy and the Marine Corps operational health services support concept for the future. It is a natural enabler to the Navy's Operational Concept **"Forward from the Sea"** and the Marine Corps **"Operational Maneuver from the Sea,"** respectively, and supports the National Military Strategy and JV-2010. NFHP-21describes a dynamic continuum from shaping the environment through deterrence and peacetime engagement, to preparing now, and to responding to the full spectrum of crisis by creating and maintaining a healthy and fit force, preventing casualties from disease and non-battle injury, and providing casualty care and management, respectively (figure 1). NFHP-21 calls for the transformation of our doctrine and organization to minimize the health services support logistics tail and to rapidly stabilize and transport casualties to the appropriate level of care. NFHP-21 is an operational health service support concept

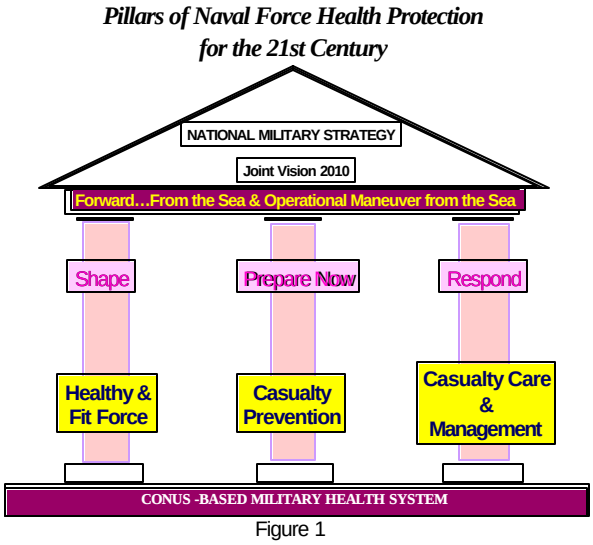

Figure 1

that relies on agile and adaptive personnel and the proper equipment and processes to enable 1) dominant maneuver, 2) precision engagement, 3) full-dimensional force protection, and 4) focused logistics..

Overview

Existing deployable medical systems are designed to support naval forces in large, sustained force-on-force operations, primarily conducted on and from the shore and large-scale, fixed medical facilities from the Battalion Aid Station to the Naval Fleet Hospital. These shore-based components (fleet hospitals) normally are large, non-mobile, labor and logistically intensive, and require relatively flat and secure shore lodgment from which to operate. Doctrinally, health service components arrive in a theater of operations coincident with the buildup of combat forces ashore. Once established, they are for all intents fixed and immobile for the duration of the operation. Not only do these facilities create a significant footprint ashore, but they are themselves a burden on the logistics and force protection systems. The concept of OMFTS and over-the-horizon warfare will require tailored, highly mobile, timely, and often, enhanced levels of casualty care and management.

Three Pillars

The NFHP-21 Concept will be based on the following three pillars as shown in Figure 1; a Healthy and Fit Force, Casualty Prevention, and Casualty Care and Management.

Healthy, Fit Force

Healthy, physically fit sailors and marines are less susceptible to illness and injury and are more likely to recover more rapidly and more completely if injured. Healthy individuals are better able to meet physical and mental challenges imposed by training and combat. Naval Force Health Protection must provide the combatant commander forces that are physically, cognitively, immunologically and psychosocially optimized to meet the demands of the operating environment. Improvements in the health status of the Naval Forces will depend on aggressive health promotion, health risk identification and mitigation, preventive medicine and wellness programs that are sponsored by the commander, managed by the medical community, and secure the commitment of individual sailors and marines.

Casualty Prevention

Prevention of illness and injury is critical in maintaining the effectiveness of Naval Forces. Prevention is accomplished through 1) leadership support of well designed Occupational Health and Safety and Industrial Hygiene programs, 2) comprehensive pre, post and intra deployment medical surveillance programs, 3) timely, accurate and continuous medical threat assessments of the operating area and opposing forces, 4) the ready availability of effective countermeasures, to include personal protective equipment, collective protective systems, immunological and chemo prophylaxis or treatment. Particular attention to food and water quality safety is required to preclude transmission of infectious disease.

Casualty Care and Management

The basis of Casualty Care and Management resides on the principles of essential care in theater and rapid evacuation out of theater and incorporates the following:

- A casualty prevention program based on an epidemiologic approach to combat and disease and non-battle injury casualties
- A care-to-user approach that leverages technology to enable casualties to continue duties and avoid evacuation and/or lengthy hospitalization
- A casualty care and management approach to clearing the battlefield using rapid stabilization, far-forward surgery, and essential care or hospitalization in-theater, all supported by a medical evacuation system that provides the required en-route care (with total in-transit visibility of casualties).

Health support elements will be capabilities based. Capability packages (personnel, supplies, equipment, and sustainment modules) must be rapidly deployable, in block or incremental form, tailored to meet the spectrum of operational requirements, using a building block, lowest denominator approach. A single capability package (CP) is a pre-established, task functional set consisting of personnel, supplies, and equipment. CPs must be interoperable and designed to support afloat and ashore operations, in naval, joint and combined operations in concert with a sea-based logistics system.

Casualty Care and Management includes First Response, Forward Resuscitative Surgery, Theater Hospitalization, En-route Care, and Definitive Care.

- **First Response**: Fosters the development of enhanced treatment practices and training, for medical personnel and for all individuals in the vicinity of wounding or injury, including the casualty (self/buddy care.)

- **Forward Resuscitative Surgery**: Focuses on specific life saving practices / core competencies to manage severe bleeding, airway compromise and life-threatening chest injuries, and to prepare the casualty for evacuation.

- **Theater Hospitalization**: Provides the range of services and diagnostics commensurate with ensuring quality "essential" care that stabilizes patients to endure inter-theater evacuation to definitive care facilities.

- **En-route Care**: Ensures continuing care of stabilized patients along the evacuation chain from point of injury to definitive care regardless of mode of transport without clinical degradation.

- **Definitive Care**: The full scope of curative and rehabilitative services and care.

Tenets of NFHP-21

Casualty Care and Management envisioned under NFHP-21:

- De-emphasizes in-theater return to duty and places primary emphasis on ***essential care in theater and rapid evacuation out of the theater*** to more definitive levels of care defined by the theater evacuation policy.

- Provides enhanced trauma care at the site of wounding or injury by highly trained, non-physician medical personnel.

- Requires ***designated*** aircraft, vehicles, and watercraft staffed and equipped for ***en-route trauma care.***

- Supports a task-oriented HSS system consisting of:

  - ***Task Functional Sets*** of people, supplies, and equipment
  - Highly ***mobile, modularized*** facilities
  - Interoperable ***Support / Augmentation Packages***
  - ***Shared, consolidated, and mutually supportable*** HSS personnel resources
  - ***Right time*** capability
  - ***New and emerging technologies*** to enhance trauma care at sea and on the battlefield
  - Enhanced C4I ***HSS planning system***

- Provides care based on emerging ***combat trauma management models*** and ***training***

- ***Increases emphasis and requirements for self / buddy aid*** training

- Requires development and implementation of ***Combat Trauma Assistant*** (CTA) and ***Combat Trauma Technician*** (CTT) type programs

- Increases ***resuscitative surgery*** requirements and desired HSS operational capabilities on casualty receiving and treatment ships (CRTS)

Combat Trauma Care and Management

Military physicians are trained to care for combat casualties using advanced trauma life support (ATLS) principles and procedures. The appropriateness of ATLS protocols in combat is unproven and some are potentially contraindicated. While these guidelines provide a standardized, systematic approach to trauma management that has proven beneficial in the civilian setting, it has questionable value and potential harm in the combat setting without modification, particularly in the pre-hospital phase of care.

The current Navy and Marine Corps health system consists of five echelons of medical care. Initial trauma care (including some emergency resuscitative surgery) is normally provided at the first two echelons and initial definitive surgery at the third. Full definitive surgery is

usually provided at echelon IV and corrective surgery is conducted at echelon V. These echelons of care can be separated by long times or distances. This separation interferes with the application of civilian advanced trauma protocols and procedures by failing to provide continual care during initial periods of evacuation. Much has been written by military trauma specialists regarding the feasibility of directly extrapolating civilian protocols for use in combat trauma management, but for the most part, these protocols are not applicable to the operational environment.

The development of a Combat Trauma Model based on clinically accepted principles of trauma care modified for the combat environment would serve as the basis for future combat casualty care protocols. The model would include care provided during triage, stabilization, tactical evacuation, and resuscitative surgery phases of care. It would address procedures for buddy / self aid as well as those applied by HSS personnel. Initial efforts in this endeavor should include an appropriate "combat trauma add-on" to the existing civilian advanced trauma and life support models to meet military medical requirements.

From Echelons of Care to Capabilities Based Levels of Care

Management of combat trauma is the most time-sensitive element of the overall mission and the one most affected by change. The emerging changes presented by FFTS and OMFTS have the potential for precluding initial deployment of HSS other than embarked medical personal and the company corpsmen assigned to the rifle companies. Based on transit times from a ship at sea and no initial shore lodgment, it will be absolutely necessary to provide significantly increased levels of trauma care at the site of wounding or injury (once the tactical condition permits.) The first intervention in this case would most likely be provided through self / buddy aid, followed by emergency medical care provided by a CTA or a CTT, who would stabilize and prepare the patient for rapid evacuation.

Echelons of care (as currently defined and practiced) are an encumbrance to the provision of trauma care under FFTS and the OMFTS and STOM concepts. The inability to task-organize HSS elements to support operations ashore could place casualties at risk of preventable disability or death if they had to be moved long distances without adequate initial intervention. ***Time*** is the critical element in developing a casualty care system for the future battlefields. The foundation of ***levels of care*** is based on the natural physiological response and progression of a wound, injury, or illness within a defined period of time from the onset of the episode as applied against likely tactical scenarios. This approach takes into consideration three critical elements of the time-trauma-operational spectrum:

- Time as a factor of physiological response to trauma,
- Time as the critical factor in morbidity and mortality, and
- Time as an inflexible element of battle.

Levels of care concentrate on clinical capabilities, not personnel, structures, or medical treatment facility location. The clinical capabilities of each level would consist of those required (within the stated time frame) to appropriately manage the casualty's condition. To provide a venue for the application of staged care, each level is further broken down into three sub-levels:

basic, intermediate, and advanced. These sub-levels would drive training and materiel requirements. Each level of care contains the clinical capabilities of the level preceding it plus its own capabilities. This approach more reasonably depicts the rational application of medical state-of-the-art as it relates to the tactical environment and is more applicable in planning HSS to support the full spectrum of operational environments.

When levels of care are mapped against a projected operation plan, appropriate HSS capability packages (CP) will be applied. For example, an operation in which the maneuver forces depart from a ship located over the horizon (25 to 50 miles off shore) and maneuver to a target 100 miles inland is associated with a distinct time line. This time line serves as the planning factor for determining the HSS requirements (capabilities based). Under ideal circumstances (weather, non-opposed airspace, minimal ground-to-air threat, etc.), a casualty could be evacuated from the point of wounding to a CRTS within 45 to 75 minutes. In this scenario, care at the objective could be limited to Level 1. If rapid evacuation is unavailable, then Level 3 capabilities may be required. The capabilities required at each level of care will determine to what extent HSS is able to support and sustain operations from a sea based OMFTS perspective.

Evacuation

The medically austere environment and extended operational ranges represented by OMFTS, coupled with Seabased Logistics and STOM, further mandates the use of aircraft as the transportation of choice for medical evacuation. ***Designated*** medical evacuation aircraft are multipurpose aircraft such as the UH-1, CH-46, CH-53, or V-22. These aircraft are designated for a clearly defined period of time to perform primary aeromedical evacuation. Designated aircraft must be outfitted with *portable medical equipment* and staffed by a *trauma transport team* specifically trained to provide en-route care. To minimize the impact on the operational commanders limited aviation assets, these aircraft are used to provide transport for casualties with life threatening wounds or injuries. ***Dedicated*** medical evacuation aircraft, on the other hand, are pre-configured with the medical equipment and staffed by trained medical crews. The time and distance factors of Seabased logistics, OMFTS, and STOM, may require changes to the current concept of aeromedical evacuation. Casualties with non-life threatening wounds or injuries would be evacuated by the conventional lifts of opportunity (air, ground, and sea).

Task Organization and Integrated HSS

Limited potential for shore-based HSS and space constraints inherent in seabased logistics, requires an interoperable, modular capabilities based system. A capability based HSS system will provide mission specific health support, consolidation of resources, potential reduction in medical materiel and a change in the mix and training of medical personnel. With the expanding spectrum of military operations ranging from peacetime, to crisis, to war, this capabilities based system is essential to providing support that is appropriate, timely, and cost effective.

Future operations will require greater coordination between participating units, and to some extent, a consolidation of capabilities. Health service support is an integral part of logistics. Sea basing will require exploitation of current and future technologies to provide total asset visibility for casualties, HSS personnel, equipment and supplies. Interoperability

requirements expand as the type of operation changes from naval to joint, combined, and coalition operations.

Casualty Receiving and Treatment Ships

CRTSs will most likely be the only source of trauma care for combat forces, especially taking into consideration the concept of Sea-based Logistics, OMFTS and STOM. Current capabilities are limited to emergency resuscitative surgery. The capability to expand medical capabilities will become even more constrained as time and distance factors increase. Increased capabilities aboard ship will be in direct competition with limited space for supplies and equipment. Clearly, the capability to rapidly evacuate patients from a CRTS following essential resuscitative surgery would minimize this requirement. It may be incumbent to establish a "medical holding" capability on a designated amphibious ship or other ships capable of evacuating casualties to a medical "safe-haven" ashore. Lack of shore-based HSS leaves no other apparent alternative.

Doctrine

The NFHP-21 concept initiates the redesign of our operational health service support system. Future experimentation, war gaming and desired or required operational capabilities will foster new Naval HSS doctrine. The changes proffered are such that the majority of current doctrine will not be applicable or adaptable--it must be completely redone.

Organization

Current Naval HSS organization will require restructuring. Some elements (CRTSs, Medical Battalion, Medical Logistics Company, Fleet Hospital, etc.) will require significant modifications and others (small shipboard medical departments) will remain basically the same. Additional options could include an amphibious ship designed to provide the appropriate level of care, and be integrated with the amphibious task force. Since this concept reduces the logistics footprint of current echelon II and III facilities, these facilities will require significant reorganization in order to gain inherent benefits. Implementation of an Operational Health Service Support Development Process may require merging or elimination of current elements to meet the requirements of a sea-based, capabilities driven HSS system.

Training

Training, for both medical and non-medical personnel will be impacted by the concept. HHS personnel who function in the CTT role will require increased training in trauma management. Entry levels training requirements for medical personnel in both Hospital Corps "A" School and Field Medical Service School will also require modification.

Equipment and Systems

A major reengineering of the current health services logistics system must be congruent with other logistics initiatives in support of Seabasing and OMFTS. Implementation of the concept likely will result in a whole new "family" of deployable medical facilities. The concept, as envisioned leverages current and future technologies, but will necessitate aggressive medical

research and development to address new requirements. The new systems needed (particularly advanced life saving and trauma support, communications, and automated data processing) should be developed to ensure compatibility with combat systems (C4I).

Support

Concept implementation may generate requirements for new and different support, but should result in less HSS (by cube and weight). The most notable changes will likely occur in transportation and sustainment requirements.